

TO: E. Burke

FROM: F. Leppla

SUBJECT: Deep Space 4 / Champollion Project Requirements Evaluation

REFERENCE: Project Service Level Agreement for Deep Space 4 / Champollion,
Initial Version, dated August 1998

The Resource Allocation Planning and Scheduling Office (RAPSO) has performed a loading study to determine the impacts of the Deep Space 4 (DS4) tracking requirements on the DSN and the ability to support those requests.

The DS4 mission plans to launch on 4/12/2003, perform a comet rendezvous on 12/2/2005, depart the comet on 4/23/2006, and possibly perform a sample return to earth on 5/31/2010. Uplink and downlink X-Band support has been requested on 34M and 70M antennas. A summary of the requirements is attached to this IOM.

In general, we believe that DS4 will receive nearly 100% of the continuous support requested during the launch phase of the mission in April and May 2003. The 34M X-band capabilities are heavily subscribed during that time while the 70M antenna capabilities are not. For example, in Australia, Voyager 2 is requesting significant 34M time but some of their support could potentially be moved to DSS-43. Likewise some of the DS4 support could possibly use DSS-43.

During the initial phases of the mission later in 2003, DS4 is in viewperiod contention with Mars Climate Orbiter, Mars01 Orbiter Mapping, Voyagers 1 and 2, and DSN Maintenance support. These activities have some minimal impact on achieving the DS4 support. Cassini has a planned TCM on May 1, 2003 but this should not impact DS4 since they are not in viewperiod contention with Cassini.

Later in the year, starting about November 1, 2003 several support requests impact the overall 34M usage of the DSN. Mars03 Lander, Stardust TCM, Europa Orbiter Launch, and Cassini Gravitational Wave activities all cause a heavy load on the 34M networks. By that time DS4 is in Cruise and Beacon Mode operations, requesting minimal support, and should receive nearly 100% of their requested time. Trade-offs will have to be made amongst the various users and antennas to maximize support for all users of the DSN.

For the subsequent years, 2004 through 2010, during cruise, comet operations and earth return, we do not see any significant support issues regarding DS4 support.

As always, the results of this evaluation are preliminary in that the network load changes as requirements for planned missions are input and updated. We will continue to work with Deep Space 4 and other users of the DSN to maximize the time available for each individual user.

Attachment:

1) Deep Space 4 / Champollion User Loading Profiles

Copy:

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